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## BRIEFER ARTICLES

### SUCCESSFUL ARTIFICIAL CULTURES OF CLITOCYBE ILLUDENS AND ARMILLARIA MELLEA

(WITH THREE FIGURES)

During the course of some culture work with the wood-destroying polypores in the fall of 1913, it was found of interest to try out similar methods with an agaric form. Spores were obtained from a fungus that



FIG. 1

at the time was identified as *Clitocybe illudens*, and from it dilution cultures were made on a beef-malt-agar medium. The spores were found to germinate readily, and in the course of three or four days numerous separate colonies appeared on the agar surface. No evidence of contamination being visible, separate colonies were transferred to sterile culture tubes of the same medium on November 15. Vigorous growth took place and the tubes soon displayed thick felts of a brownish-white mycelium.

Early in December a small dark brown area was noticed in one of the cultures, which soon gave rise to several dark brown finger-like papillae. These continued to elongate, and lighter colored, somewhat more slender regions appeared at their tips. These now enlarged rapidly and soon

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took on the "button" form of the young fruiting agaric. On December 26, the accompanying photograph (fig. 1) was taken, and four days later the pilei had opened to the mature condition shown in the second photograph (fig. 2). As will be seen, the fruit bodies developed in a quite normal manner, and, except for their size and the somewhat "recurved" condition of the pilei, appeared to be quite normal. Fruit bodies examined with the microscope were seen to be sporulating profusely, and the spores were found to be quite normal as to color, shape, and size for this form. Upon being transferred to the beef-malt-agar medium, the spores germinated quite as readily as those from the original fruit bodies. Cultures are at present being maintained with the hope of obtaining a second fruiting generation, but as yet (March 14, 1914) no indications of the formation of fruiting bodies of the second generation have been observed.<sup>1</sup>



FIG. 2

The fact that the formation of normal fruit bodies on a synthetic medium is somewhat rare led me to consider what possible conditions may have effected this result. Cultures were found to fruit in either light or darkness, and so the presence or absence of light as a factor seemed to be eliminated, although it must be said that the first stages were always initiated in the dark. All cultures from the same fruit body made on one particular lot of medium, which had been slightly

<sup>1</sup> Since the preparation of this article, numerous fruiting bodies of the second spore generation have been obtained, showing such striking variations in form from the original parent that it has been thought best to discuss this phase in a future paper.

scorched in preparation, either fruited or produced abortive fruit bodies, while no fruiting was observed in other cultures. The scorched condition of the medium would of course give rise to substances not generally present in the culture medium, and it is suggested that this condition of nutrition may have been the determining factor. It is also of interest to note that the fruit bodies from which the spores were obtained were frozen solid when collected, which did not appear to injure the viability of the spores.

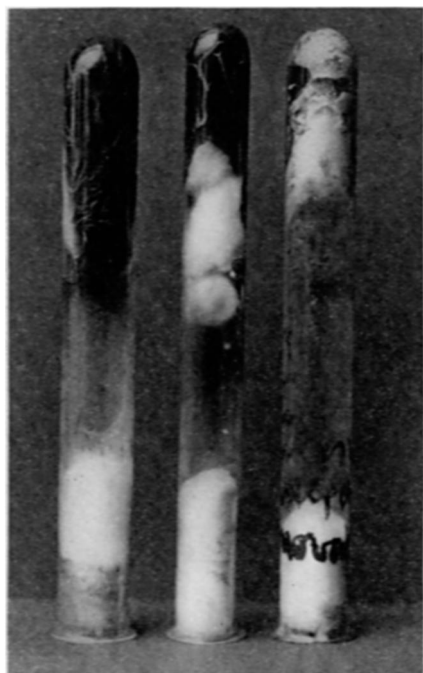


FIG. 3

branching dichotomously (fig. 3). Upon penetrating to a free surface these rhizomorphs immediately give rise to the ordinary vegetative mycelium.—V. H. YOUNG, *University of Wisconsin, Madison*.

#### THE AMOUNT OF BARE GROUND IN SOME MOUNTAIN GRASSLANDS

In July 1911 the writer staked out a series of 19 quadrats for study of the grassland of a mountain park at Tolland, Colorado. In that year collections were begun and censuses of some of the quadrats made. The plan was adopted of estimating at intervals the percentage composi-